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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/951,201	10/14/1997	WILLIAM M. WOODARD	33470US	1323

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EXAMINER

DOROSHENK, ALEXA A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/951,201

Applicant(s)

WOODARD ET AL.

Examiner

Alexa A. Doroshenk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,22,23,25,26 and 28-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,22,23,25,26 and 28-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 22, 23, 25, 26, 28-33 and 35 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The subject matter which was not described in the specification is that directed toward a "loop reactor". Applicant has added this subject matter to independent claims 1, 22 and 28 by amendment. Applicant states that support for this amendment can be found on page 18, lines 7-8. This passage of the specification states:

"All trimerization reactions disclosed in Runs 101-112 can be considered continuous feed reactions, i.e., not batch reactions."

Besides the term "loop" not being found in the specification, the examiner does not find this to be sufficient support for the newly added limitations of a "loop" reactor. For examination purposes, by the cited support for the limitation it appears that applicant is attempting to equate the term "loop reactor" with a continuous reactor and the claims have been treated as such.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 28, 29, 31 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Avidan et al. (4,778,661).

With respect to claims 28 and 34 Avidan et al. discloses an apparatus comprising:

a loop/continuous (col. 1, lines 8-12 and col. 2, lines 34-39) reactor (2) of solution, slurry or gas phase (col. 6, lines 23-30);

a first inlet line (23) for olefin reactant (inherently connected to a source of that olefin);

a second inlet line (14) for catalyst operably connected to a source of catalyst (13);

wherein said first and second inlet lines are separate from one another (see figure 1) and located in the reactor to provide contact within the reactor of the materials they carry (col. 6, line 59- col. 7, line 3);

an effluent line (46) from the reactor for transferring olefin, catalyst and reaction products (col. 7, lines 23-26); and

a separator (50) connected to the effluent line (46) after discharge from the reactor to separate desired products such as catalyst and reaction products (col. 7, lines 29-32).

With further respect to the limitation of a loop reactor, though applicant does not have support for a reactor of an actual loop formation, it is noted that the reactor of Avidan et al. does comprise a loop by way of elements 10, 12, 13, 14 and 16.

With respect to the limitation in claims 34-36 of a homogeneous or homogeneous liquid catalyst system, it is held by the examiner that this terminology indicates the nature of the catalyst in the apparatus. The material or article worked upon does not limit apparatus claims. MPEP 2115.

With respect to claim 29, Avidan et al. discloses wherein a filter can be operably connected into the effluent line (col. 8, lines 62-65).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 22, 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Lashier et al. (5,689,028) and Mehra et al. (5,521,264).

With respect to claim 22, Avidan et al. discloses an apparatus comprising:
a loop/continuous (col. 1, lines 8-12 and col. 2, lines 34-39) reactor (2) of solution, slurry or gas phase (col. 6, lines 23-30);

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a first inlet line (23) for olefin reactant (inherently connected to a source of that olefin);

a second inlet line (14) for catalyst operably connected to a source of catalyst (13);

wherein said first and second inlet lines are separate from one another (see figure 1) and located in the reactor to provide contact within the reactor of the materials they carry (col. 6, line 59- col. 7, line 3);

an effluent line (46) from the reactor for transferring olefin, catalyst and reaction products (col. 7, lines 23-26); and

a separator (50) connected to the effluent line (46) after discharge from the reactor to separate desired products such as catalyst and reaction products (col. 7, lines 29-32).

With further respect to the limitation of a loop reactor, though applicant does not have support for a reactor of an actual loop formation, it is noted that the reactor of Avidan et al. does comprise a loop by way of elements 10, 12, 13, 14 and 16.

The apparatus of Avidan et al. discloses all of the structural elements as described above, but does not disclose an inlet for catalyst system deactivator.

Lashier et al. discloses a process to regulate olefin production in which a catalyst comprising a chromium source, a pyrrole-containing compound and a metal alkyl (col. 1, lines 55-59) is deactivated in the reactor effluent stream (col. 5, line 65- col. 6, line 21). Lashier et al. disclose that the reaction products can be prepared from a conventional gas phase catalyst system (col. 4, line 65- col. 5, line 2). It would have been obvious to

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one of ordinary skill in the art at the time the invention was made to include an inlet for catalyst deactivator into the effluent stream of Avidan et al. gas phase catalyst system in order to regulate the production of olefin during trimerization once it has left the reactor.

Avidan et al. is silent as to an inlet line connected to a source of trimerization reaction solvent.

Mehra et al. discloses an apparatus similar to that of Avidan et al. including a separator, a reactor, filters, and a solvent inlet line (col. 13, lines 61-65 and reference number 98). Mehra et al. teaches the use of a solvent to absorb ethylene, higher alpha olefin comonomers, and heavier hydrocarbons (col. 13, lines 61-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a solvent inlet in optimal operable connection in the apparatus of Avidan et al. to incorporate the teaching of Mehra et al. and further to remove heavies during operation.

With respect to claim 23, Avidan et al. discloses wherein a filter can be operably connected into the effluent line (col. 8, lines 62-65).

With respect to claim 25, it would be inherent in the apparatus to have a line with which a source of olefin is connected to the olefin inlet line (23) in order to satisfy the requirement of providing olefin.

7. Claims 1, 2, 4 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Lashier et al. (5,689,028), Mehra et al. (5,521,264) and Reagen et al. (5,376,612).

With respect to claim 1 and 35, Avidan et al. discloses an apparatus comprising:

a loop/continuous (col. 1, lines 8-12 and col. 2, lines 34-39) reactor (2) of solution, slurry or gas phase (col. 6, lines 23-30);

a first inlet line (23) for olefin reactant (inherently connected to a source of that olefin);

a second inlet line (14) for catalyst operably connected to a source of catalyst (13);

wherein said first and second inlet lines are separate from one another (see figure 1) and located in the reactor to provide contact within the reactor of the materials they carry (col. 6, line 59- col. 7, line 3);

an effluent line (46) from the reactor for transferring olefin, catalyst and reaction products (col. 7, lines 23-26); and

a separator (50) connected to the effluent line (46) after discharge from the reactor to separate desired products such as catalyst and reaction products (col. 7, lines 29-32).

With further respect to the limitation of a loop reactor, though applicant does not have support for a reactor of an actual loop formation, it is noted that the reactor of Avidan et al. does comprise a loop by way of elements 10, 12, 13, 14 and 16.

The apparatus of Avidan et al. discloses all of the structural elements as described above, but does not disclose an inlet for catalyst system deactivator.

Lashier et al. discloses a process to regulate olefin production in which a catalyst comprising a chromium source, a pyrrole-containing compound and a metal alkyl (col. 1, lines 55-59) is deactivated in the reactor effluent stream (col. 5, line 65- col. 6, line 21).

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Lashier et al. disclose that the reaction products can be prepared from a conventional gas phase catalyst system (col. 4, line 65- col. 5, line 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an inlet for catalyst deactivator into the effluent stream of Avidan et al. gas phase catalyst system in order to regulate the production of olefin during trimerization once it has left the reactor.

Avidan et al. is silent as to an inlet line connected to a source of trimerization reaction solvent.

Mehra et al. discloses an apparatus similar to that of Avidan et al. including a separator, a reactor, filters, and a solvent inlet line (col. 13, lines 61-65 and reference number 98). Mehra et al. teaches the use of a solvent to absorb ethylene, higher alpha olefin comonomers, and heavier hydrocarbons (col. 13, lines 61-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a solvent inlet in optimal operable connection in the apparatus of Avidan et al. to incorporate the teaching of Mehra et al. and further to remove heavies during operation.

Avidan et al. does not disclose wherein the source of catalyst is a homogeneous liquid catalyst system.

Reagen et al. teaches a catalyst to trimerize, oligomerize or polymerize olefins provides useful olefins by increased selectivity (col. 1, lines 18-40) and teaches wherein such a catalyst can be a homogenous liquid catalyst system (col. 60, lines 11-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the catalyst system of Reagen et al. for the catalyst of Avidan et al. in order to achieve increased selectivity of reaction product.

With respect to claim 2, Avidan et al. discloses wherein a filter can be operably connected into the effluent line (col. 8, lines 62-65).

With respect to claim 4, it would be inherent in the apparatus to have a line with which a source of olefin is connected to the olefin inlet line (23) in order to satisfy the requirement of providing olefin.

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Lashier et al. (5,689,028).

The apparatus of Avidan et al. discloses all of the structural elements as described above, but does not disclose an inlet for catalyst system deactivator.

Lashier et al. discloses a process to regulate olefin production in which a catalyst comprising a chromium source, a pyrrole-containing compound and a metal alkyl (col. 1, lines 55-59) is deactivated in the reactor effluent stream (col. 5, line 65- col. 6, line 21). Lashier et al. disclose that the reaction products can be prepared from a conventional gas phase catalyst system (col. 4, line 65- col. 5, line 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an inlet for catalyst deactivator into the effluent stream of Avidan et al. gas phase catalyst system in order to regulate the production of olefin during trimerization once it has left the reactor.

9. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Harandi et al. (4,788,366).

Avidan et al. is silent as to an inlet line connected to a source of heavies.

Harandi et al. discloses a similar trimerization system with olefin feed, catalyst feed, effluent line (22), effluent separation and a feedstock or recycle inlet (21) operably

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connected to the effluent line wherein the source of feedstock for the process could contain heavies (col. 3, lines 41-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a heavies inlet in the apparatus of Avidan et al. as providing such an inlet further promotes the production of Avidan et al.'s desired products as taught by Harandi et al. (which also produced products such as Avidan et al.).

10. Claims 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Lashier et al. (5,689,028) and Mehra et al. (5,521,264) as applied to claim 22 above, and further in view of Harandi et al. (4,788,366).

Avidan et al. is silent as to an inlet line connected to a source of heavies.

Harandi et al. discloses a similar trimerization system with olefin feed, catalyst feed, effluent line (22), effluent separation and a feedstock or recycle inlet (21) operably connected to the effluent line wherein the source of feedstock for the process could contain heavies (col. 3, lines 41-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a heavies inlet in the apparatus of Avidan et al. as providing such an inlet further promotes the production of Avidan et al.'s desired products as taught by Harandi et al. (which also produced products such as Avidan et al.).

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Lashier et al. (5,689,028), Mehra et al. (5,521,264) and Reagen et al. (5,376,612), as applied to claim 1 above, and further in view of Harandi et al. (4,788,366).

Avidan et al. is silent as to an inlet line connected to a source of heavies.

Harandi et al. discloses a similar trimerization system with olefin feed, catalyst feed, effluent line (22), effluent separation and a feedstock or recycle inlet (21) operably connected to the effluent line wherein the source of feedstock for the process could contain heavies (col. 3, lines 41-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a heavies inlet in the apparatus of Avidan et al. as providing such an inlet further promotes the production of Avidan et al.'s desired products as taught by Harandi et al. (which also produced products such as Avidan et al.).

12. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Avidan et al. (4,778,661) in view of Mehra et al. (5,521,264).

Avidan et al. is silent as to an inlet line connected to a source of trimerization reaction solvent.

Mehra et al. discloses an apparatus similar to that of Avidan et al. including a separator, a reactor, filters, and a solvent inlet line (col. 13, lines 61-65 and reference number 98). Mehra et al. teaches the use of a solvent to absorb ethylene, higher alpha olefin comonomers, and heavier hydrocarbons (col. 13, lines 61-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a solvent inlet in optimal operable connection in the apparatus of Avidan et al. to incorporate the teaching of Mehra et al. and further to remove heavies during operation.

Response to Arguments

35 USC §112

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Applicant argues a USC 112 first paragraph rejection of claims 1, 2, 4, 5, 34 and 35 regarding a homogenous catalyzed system. The examiner withdrew this rejection in the previous Final Office Action and therefore these arguments are considered moot.

Applicant argues that their disclosure supports the term "loop" reactor because it recites "conventional equipment".

The examiner continues to disagree with applicant. While such a recitation may enable a "loop" reactor, there is not a sufficient written description of such a reactor so as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

35 USC §102(b)

Applicant argues that Avidan et al. does not include a loop reactor as now set forth in claims 1, 22 and 28.

The examiner respectfully disagrees with applicant. As discussed in the 35 USC §112 rejection above, the support cited by applicant for the limitation of a "loop reactor" appears to equate the term "loop reactor" with a continuous reactor. In the rejection of these claims above, it is noted that Avidan et al. discloses that the reactor is also a continuous reactor (col. 1, lines 8-12 and col. 2, lines 34-39).

Though applicant does not have support for a reactor of an actual loop formation, it is noted that the reactor of Avidan et al. does comprise a loop by way of elements 10, 12, 13, 14 and 16.

35 USC §103(a)

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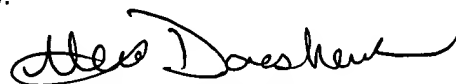
In response to applicant's argument that Mehra does not discuss the dilution of a catalyst stream, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexa A. Doroshenk
Examiner
Art Unit 1764